

leisure most untiringly to this labour of love. Within the narrow limits of this book the author has indeed amassed great stores of information, and has referred the reader to most of the original sources, should he desire to follow up the study of Palæontology.

This first volume is to be followed by others on the Secondary and Tertiary Fossils.

MISCELLANEOUS.

On some Lepidoptera with Terebrant Trunks, destructive of Oranges.

By M. J. KÜNCKEL.

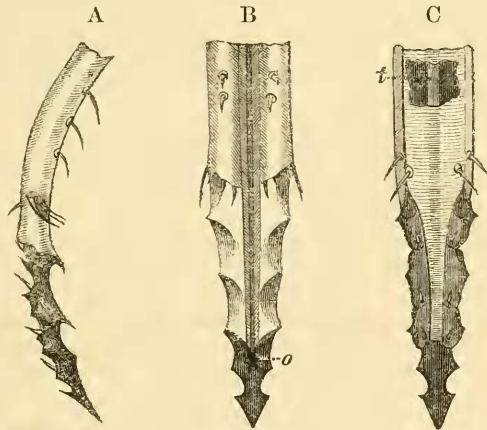
A FRENCH botanist, M. Thozet, residing at Rockhampton, in Australia, called my attention some years ago (in 1871) to a Lepidopteron of the genus *Ophideres* (*O. fullonica*, Linn.), which he charged with piercing oranges in order to feed upon their juice. Being convinced, like all other naturalists, that the Lepidoptera have without exception flexible trunks, with no rigidity, I doubted the observation of M. Thozet, and shut up in a box the asserted depredators, proposing to examine them at my leisure. This examination I put off from day to day, until I lately read in an Australian journal* an article in which an anonymous author noticed the depredations committed by *O. fullonica*†, and affirmed, with all the guarantees of careful observation, that these moths perforate the skin of the oranges in order to pump out their juice. During the summer nights they may, without great precautions, be detected at work; absorbed in the operation they are performing, they allow themselves to be captured by hand even upon the oranges. Being curious to obtain evidence of the correctness of these observations, I now carefully examined the trunk of these insects. What was my surprise at discovering a singular and most unexpected fact of adaptation.

It is well-known that the Lepidoptera are distinguished from all other insects by a character of organization of absolute fixity: the buccal organs are modified to form a trunk; or, more explicitly, as was demonstrated by Savigny, the excessively elongated maxillæ constitute an organ of suction. These long, slender, flexible maxillæ, terminated by a thin point of great flexibility, are applied to each other, but leave between them a fine canal. The Lepidoptera are therefore constructed to suck up the nectar of open flowers, to imbibe various fluid aliments. By a strange exception, the moths of the genus *Ophideres*, Boisd., possess a rigid trunk, a true borer of ideal perfection, capable of piercing the skin of fruits, of boring through even the thickest and most resistant envelopes. This trunk is a perfect instrument, which would be an excellent model for the

* 'The Capricornian,' vol. i. no. 9, May 8, 1875, published at Rockhampton. Kindly communicated to me by M. Carrière, head gardener of the nurseries of the Museum.

† In the article in question the moth is by mistake called *O. zullonia*.

making of new tools to be employed in boring holes in various materials. Partaking at once of the barbed lance, the gimlet, and the rasp, it can pierce, bore, and tear, at the same time allowing liquids to pass without impediment by the internal canal. The two applied maxillæ terminate in a sharp triangular point, furnished with two barbs; they then become enlarged, and present on the lower surface three portions of the thread of a screw; while their sides and their upper surface are covered with short strong spines, projecting from the centre of a depression with hard and abrupt margins. The purpose of these spines is to tear the cells of the orange-pulp, as the rasp serves to open the cells of the beetroot, in order to extract the sugar from them. The upper region of the trunk is covered below and on the sides with fine close-set striæ, arranged in half-screws, which give it the properties of a file; the striæ are interrupted here and there by small spines of soft consistence, which serve for the perception of tactile sensations. The orifice of the canal through which the liquids ascend is situated on the lower surface below the first screw-thread. The annexed figures will serve to render this short description sufficiently intelligible.



Trunk of *Ophideres fullonica*. A, in profile; B, from below; C, from above; *t*, interior canal; *o*, orifice of the canal.

Not content with examining *Ophideres fullonica*, Linn., I investigated all the representatives of the genus, and found that *O. materna*, Linn., *O. salamina*, Cram., *O. imperator*, Bois., as well as the other species, have a powerful trunk in the form of a borer. The structure of the maxillæ therefore furnishes a generic character of great value; moreover it establishes a closer relationship between the Lepidoptera, the Hemiptera, and certain Diptera in which the maxillæ are destined to pierce tissues.

The Australian colonists dread *O. fullonica* on account of the mischief caused by it in the orange-plantations; for the fruits which

it pierces with holes quickly spoil, and soon fall to the ground and rot. All the Lepidoptera of the genus *Ophideres* being, as I have just shown, furnished with a terebrant trunk, it is incontestable that they have similar habits, and that they will bore into oranges and other fruits. As they are very widely diffused in tropical regions, they must justly be ranged among injurious insects. Unfortunately their early stages are unknown, so that no really practical method of destruction suggests itself to the mind; but their large size and striking colours allowing them to be recognized at the first glance, they may be killed without any fear of reproach for committing a judicial error.—*Comptes Rendus*, August 30, 1875, pp. 397-400.

Corals at the Galapagos Islands. By L. F. POURTALÉS.

The Galapagos Islands are, as is well known, an important point in the geographical distribution of corals, being almost exactly on the boundary of the coral-producing part of the Pacific Ocean and that portion which is destitute of them on account of the low temperature of the water. All the writers on the subject have placed this group of islands in this latter portion. During the visit of the United-States Coast-Survey steamer 'Hassler,' a number of specimens of corals, of which the following is the list, were picked up on the beaches of several of the islands:—

- Ulangia Bradleyi*, Verrill. Indefatigable Island.
- Pavonia gigantea*, Verrill. James Island.
- *clivosa*, Verrill. Indefatigable Island.
- , sp. James Island.
- Astropsammia Pedersenii*, Verrill.
- Pocillipora capitata*, Verrill. Jervis and Charles Islands.
- Porites*, sp.

The undetermined *Pavonia* is a massive species with larger calicles than those of the two other ones, and more porous and lighter. The specimen is too much rolled for nearer determination. The *Porites* is massive also and in the same condition.

The species are all, or nearly all, identical with those found at Panama. They are mostly reef-builders, but here live probably isolated and at a certain depth, having never been observed *in situ*. In individual growth they are fully equal to those from more favoured localities, the rolled pieces of *Pavonia* measuring six or seven inches in diameter, thus indicating masses of considerable size originally. They are not confined to the northernmost islands of the group, where we should more naturally look for them, from the greater proximity to the warm current, but, as the list shows, a *Pocillipora* was found at Charles Island, one of the southernmost. The probability of fragments drifting from one island to the other is very small, owing to the considerable depth of water between them.—*Silliman's American Journal*, October 1875.